REMARKS/ARGUMENTS

The claims are 3-11 and 13-14, with claims 15-23 having been withdrawn from consideration by the Examiner as directed to a non-elected invention. Claim 13 has been amended to be in independent form and to be directed to a bearing element. Accordingly, claim 14, which previously depended on claim 13, has been amended to be directed to a bearing element as well. In addition, claims 2 and 12 have been canceled and claims 3-11 have been amended to be directed to a bearing element dependent directly or indirectly on claim 13 as amended. Also, claim 4 has been amended to delete the element nickel, claim 6 has been amended to delete the elements graphite, palladium, platinum, yttrium, scandium and lanthanoids, and claim 7 has been amended to change the term "soft phase" to -- lubricant --. Claim 13 has also been amended to change the term "second peripheral coating" to -- supporting layer -- and to specify that the coating is able to adapt and embed pieces abraded from the parts to be supported. Claim 14 has been amended to refer to a diffusion barrier or adhesion -- layer --. Support for the claims may be found, *inter alia*, in the disclosure at pages 1-2, 5, 7, 10-11 and FIG. 1 and 2. Reconsideration is expressly requested.

Claims 2-4, 6, 10, and 12 were rejected under 35 U.S.C. §102(e) as being anticipated by *Seth et al. U.S. Patent Application Publication No. 2004/0110021*. The remaining claims 5, 7-9, 11 and 13-14 under consideration by the Examiner were rejected under 35 U.S.C. §103(a) as being unpatentable over *Seth et al.*

In response, Applicants have amended claim 13, *inter alia*, to better define the invention and respectfully traverse the Examiner's rejection for the following reasons.

As set forth in claim 13 as amended, Applicants invention provides a bearing element including at least a first peripheral coating and a supporting layer disposed on top of the first peripheral coating. The first peripheral coating is formed by an anti-friction coating produced by means of a cold gas spraying process made from an alloy comprising a matrix element and at least one phase element.

As recited in claim 13 as amended, the matrix element forms a matrix and the at least one phase element has a phase selected from the group consisting of a soft phase and a hard phase. The at least one phase element forms a solid solution or a bond with

the matrix element and is dispersed in the matrix. The solid solution or bond is formed only in the region of the phase boundary of the matrix with the at least one phase element so that the first peripheral coating is able to adapt and embed pieces abraded from parts to be supported.

Seth et al. teaches a wear and erosion resistant alloy applied by cold spray technique. See title. Therefore, a particle mixture of an alloy material, a hard material and/or a solid lubricant material is applied to a substrate. See Abstract.

The alloy material of *Seth et al.* may be a cobalt, iron or nickel matrix material (= first material 20, see paragraph [0021] of *Seth et al.*). The hard material may be tungsten carbide (second material 22, see paragraph [0021] of *Seth et al.*). The solid lubricant may be molybdenum disulfide or graphite (see paragraph [0029] of *Seth et al.*).

It is respectfully submitted that there is a difference between a solid lubricant and the soft phase as recited in Applicants' claim 13 as amended. The solid lubricant promotes only the lubrication as is described in *Seth et al.* at paragraph

[0029]. In contrast, the soft phase is able to embed particles from the abrasion and to give the bearing element a better ductility for the adaptation of the bearing element to the surface of the supported part in the run-in period of the bearing element.

Seth et al. discloses different uses of the wear alloy. See paragraphs [0031] and [0032] of *Seth et al.* None of these uses is directed to a bearing element because *Seth et al.'s* wear alloy is hard (from the hard particles) and only has the ability to reduce the friction by the solid lubricant. Because of the hardness this alloy has no ability to embed dust particles from the supported part and of the adaptation.

It should be noted that graphite is a solid lubricant rather than a "soft phase" because graphite has a sandwich-like structure built up from single layers which can be moved. By this movement the lubrication function results. Graphite has no embedding quality because it is not ductile. Further, graphite reacts with elements to form carbides, for example tungsten carbide, which are known as hard materials.

In view of *Seth et al.'s* disclosure, the reaction of graphite with the matrix element is not desired because graphite would lose its lubrication quality. On the other hand, the addition of carbide particles to the particle mixture is one of the essential features of *Seth et al.* Therefore, it is respectfully submitted that one skilled in the art would believe that it would make no sense to add carbides on the one hand and to allow the reaction of graphite to carbides on the other hand. If a person skilled in the art wants a higher amount of carbides in the coating of *Seth et al.*, it is respectfully submitted that he or she would increase the carbide amount in the particle mixture. Therefore, it is respectfully submitted that claim 13 as amended cannot be rendered anticipated or obvious by *Seth et al.* because there is no disclosure or suggestion in *Seth et al.* of at least one phase element forming a solid solution or a bond with the matrix element.

Seth et al.'s method is similar to the cold gas spraying process used to produce the anti-friction coating recited in Applicants' claim 13 as amended. The cold gas spraying method is known in principle from the prior art, for example from *EP 0 484 533 B1*, cited at page 11 of Applicants' disclosure and also from *U.S. Patent No. 5,302,414* to *Alkhimov et al.* cited at *paragraph*

[0019] of *Seth et al.* It is respectfully submitted that Applicants' bearing element as recited in amended claim 13 is not directed to a cold gas spraying process per se, but rather to a bearing element with an anti-friction coating with a solid solution or a bond of the phase element with the matrix element only in the region of the phase boundary. See also FIG. 1 of Applicants' disclosure. For example, to achieve the anti-friction coating as recited in Applicants' claim 13 as amended, a gas temperature of the gas jet up to 130% of the melting temperature of the alloy element with the lowest melting temperature could be used. See page 7, first full paragraph of Applicants' disclosure. The elements Fe, Co or Ni have melting temperatures far in excess of 1700°C and graphite has a melting point of 3600°C. It is respectfully submitted that it is not the sense of the **cold** gas spraying process recited in Applicants' claim 13 as amended to apply the particles with a temperature of 1700°C and more.

Therefore, it is respectfully submitted that the recitation in claim 13 as amended of forming a solid solution or bond is not met by the disclosure of *Seth et al.*

Applying the phase element particles with a higher temperature of the gas jet has the further advantage that the flow rate of the gas will increase and hence also the particle velocity, thereby improving the properties of the coating in terms of its density, homogeneity or adhesion capacity in particular. See page 11, last full paragraph of Applicants' disclosure.

Accordingly, it is respectfully submitted that Applicants' claim 13 as amended cannot be considered anticipated or rendered obvious by *Seth et al*.

With respect to the Examiner's position at page 4, last paragraph of the Office Action, it is respectfully submitted that Applicants' claim 13 as amended is not directed to an embodiment wherein at least two coatings are applied and that the second peripheral coating is the supporting layer or in other words the substrate. Therefore, it is respectfully submitted that the Examiner's position at page 4, last paragraph, is unfounded.

Claim 3 as amended is dependent on claim 13 as amended and further specifies that the region of the phase boundary in which the solid solution or bond is formed has an average thickness in

the range of between 0.1 µm and 3 µm. It is respectfully submitted that there is no disclosure or suggestion in *Seth et al.* of a solid solution or a bond of the phase element with the matrix element and, therefore, it is respectfully submitted that claim 3 as amended is patentable over *Seth et al.* for this additional reason.

Claim 5 as amended is dependent on claim 4 as amended which in turn is dependent on claim 13 as amended and further specifies that the proportion of the matrix element is at least 55% by weight. In paragraph [0028], *Seth et al.* discloses a composition with 75-96 wt.-% carbide particles and the remainder particles of cobalt, iron, nickel and/or alloys thereof. This disclosure is the only disclosure in *Seth et al.* of a composition. Cobalt, iron, nickel and/or alloys thereof form the matrix element. See paragraph [0021] of *Seth et al.* Therefore, it is respectfully submitted that the disclosure of *Seth et al.* is far away from a proportion of the matrix element of at least 55 wt.-% as recited in Applicants' claim 5 as amended, which it is respectfully submitted would be considered clear from the disclosure of *Seth et al.*, which is directed to a hard facing material. See paragraph [0005] of *Seth et al.* The matrix element of *Seth et al.* has only the function of a binder because the hard particles

are not able to sufficiently bond with the substrate. See paragraph [0028] of *Seth et al*. Therefore, it is respectfully submitted that it would not have been obvious to one of ordinary skill in the art to add any amount of the matrix material in the coating from the disclosure or *Seth et al*.

Claim 8 as amended is dependent on claim 6 as amended which in turn is dependent on claim 13 as amended and further specifies that the phase is a soft phase and the proportion of soft phase is in the range of between 10% by weight and 45% by weight. As discussed previously, *Seth et al*. fails to disclose or suggest a soft phase element as graphite is a lubricant and not a soft phase element. Accordingly, it is respectfully submitted that claim 8 as amended is patentable over *Seth et al*. for this additional reason.

Claim 11 as amended is dependent on claim 9 as amended which in turn is dependent on claim 13 as amended and further specifies that the phase is a hard phase and the proportion of hard phase is in the range of btween 3% by weight and 25% by weight. *Seth et al*. discloses a composition with 75-96 wt.-% carbide particles. See paragraph [0028]. With a proportion of the hard

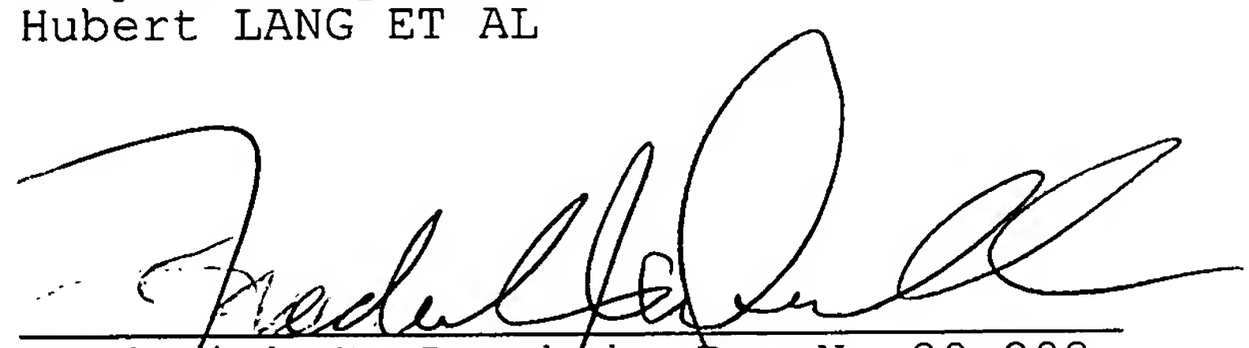
particles of 75 wt.-% and more, the anti-friction material employed in Applicants' claim 11 as amended would become too hard. Therefore, it is respectfully submitted that Applicants' claim 11 is patentable over *Seth et al.* for this additional reason.

Claim 14 as amended is dependent on claim 13 as amended and further specifies that an additional coating is provided between the first peripheral coating and the supportnig layer in the form of a diffusion barrier or adhesion layer. It is respectfully submitted that there is no disclosure or suggestion in *Seth et al.* of a diffusion barrier or adhesion layer. *Seth et al.* discloses only an intermediate layer as buffering layer to accommodate adverse effects of differences in coefficient of thermal expansion between the wear alloy and the base metal. See paragraph [0024] of *Seth et al.* Therefore, it is respectfully submitted that claim 14 as amended is patentable over *Seth et al.* for this additional reason.

In summary, claims 2 and 12 have been canceled and claims 3-11 and 13-14 have been amended. In view of the foregoing it is respectfully requested that the claims be allowed and that this application be passed to issue.

Applicants also submit herewith a Third Supplemental Information Disclosure Statement.

Respectfully submitted,
Hubert LANG ET AL



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Enclosures:
Third Supplemental Information Disclosure Statement
Form PTO-1449
Check in the amount of $180.00

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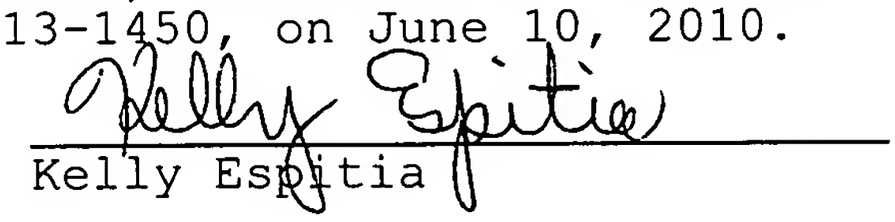

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